CLAIMS

What is claimed is:

1. A method for direct-conversion of a modulated radio-frequency (RF) signal, comprising:

receiving an RF signal; and

mixing the RF signal with a plurality of oscillator signals with different phases in an interleaving manner.

- 2. The method as recited in claim 1, wherein the RF signal is converted to a differential RF signal.
- 3. The method as recited in claim 1, wherein the oscillator signals include an oscillator signal frequency substantially equal to an RF signal frequency of the RF signal.
- 4. The method as recited in claim 1, wherein the RF signal is modulated over a finite bandwidth.
- 5. The method as recited in claim 1, wherein the oscillator signals have phase differences of 45, 135, 225 and 315 degrees.
- 6. The method as recited in claim 1, wherein the mixing is carried out by a plurality of mixers.
- 7. The method as recited in claim 6, wherein the oscillator signals are input to the mixers in the interleaving manner.

- 8. The method as recited in claim 7, wherein the oscillator signals are input to the mixers in the interleaving manner by switching which oscillator signals are input to which mixers.
- 9. The method as recited in claim 8, wherein the switching occurs at a rate that is faster than a bandwidth of the RF signal.
- 10. The method as recited in claim 8, wherein the switching occurs in a substantially random manner.
- 11. The method as recited in claim 10, wherein the switching occurs in a random manner.
- 12. The method as recited in claim 1, wherein a modulation of the RF signal is reconstructed as a baseband signal using a de-interleaving operation.
- 13. The method as recited in claim 12, wherein an in-phase baseband signal and a quadrature baseband signal is generated by the reconstruction.
- 14. The method as recited in claim 12, wherein the de-interleaving operation includes inverting and routing operations.
- 15. The method as recited in claim 13, wherein low-pass filtering is applied to the in-phase baseband signal and the quadrature baseband signal.
- 16. The method as recited in claim 15, wherein a direct current (DC) offset of the in-phase baseband signal and the quadrature baseband signal is removed.
- 17 The method as recited in claim 15, wherein an amplitude distortion and a phase distortion of the in-phase baseband signal and the quadrature baseband signal are equated.

- 18. A direct-conversion subsystem, comprising: means for receiving an RF signal; and means for mixing the RF signal with a plurality of oscillator signals with different phases in an interleaving manner.
- 19. A direct-conversion subsystem, comprising: at least one mixer for mixing an RF signal with a plurality of oscillator signals with different phases in an interleaving manner.
- 20. A system, comprising:
 a device in communication with a wireless communication network;
 wherein the device includes an integrated circuit including:
 at least one mixer for mixing an RF signal with a plurality of oscillator signals with different phases in an interleaving manner.
- 21. A method for direct-conversion of a modulated signal, comprising:
 receiving a signal; and
 mixing the signal with a plurality of oscillator signals with different phases in
 an interleaving manner.